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RESEARCH ARTICLE

A COMPARATIVE STUDY OF USING DYNAMIC HIPSCREWVSMULTIPLECANCELLOUSSCREW FIXATIONINFRACTURENECK OF FEMURIN YOUNGADULTS

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Abstract

Introduction: Incidence of fracture of neck of femur is increasing in young adults. Dynamic Hip Screw with a derotation screw or CC screw is used in operation to reduce and stabilize femoral neck fractures. the commonest complications of intracapsular fractures of neck femur are non-union and avascular necrosis.

Material And Methods: The study included 40 patients with history of trauma and diagnosed with fracture neck of femur. After thorough evaluation of patient , Pre-operative radiograph of pelvis with both hips were taken. Routine preoperative profile was done in each patient, along with pre-anesthetic check-up. Follow-up X-rays were taken at each follow-up, which were scheduled at 6 weeks, 3 months, 6 months and at 12 months. Functional and radiological outcome were assessed by scoring

Modified Harris Hip Score Observation And Results At 12 months: The mean Harris Hip Score in Group 1 was 84.69 ± 4.51 and in Group 2 it was 90.68 ± 2.54. The mean Harris Hip score at 12 months was significantly higher in Group 2 as compared to Group 1 (P=0.001).

Conclusion: When it came to treating fractures of the neck of the femur in young adults, our research found that dynamic hip screw fixation performed better than cancellous screw fixation. In terms of functional outcome, the dynamic hip screw had a higher Harris Hip Score and a lower rate of avascular necrosis. Based on the findings of this study, we recommend using a dynamic hip screw rather than a cancellous screw to fix a fracture of the neck of the femur. We recommend larger studies because there is a lack of research comparing these two fixation modalities.

Introduction:-

Intracapsular fractures of neck femur have always presented a great challenge to orthopedic surgeons and remain in many ways the unsolved fracture as far as treatment and results are concerned especially in younger population.[1]

With increasing frequency of high energy trauma, the incidence of fracture of neck of femur is increasing in young adults.[2]This number is predicted to rise to 2.5 million by 2025 and 4.5 million by 2050, assuming there is no age specific increase.

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The Dynamic Hip Screw with a derotation screw or CC screw is used in operation to reduce and stabilize fractures in young adults. This allows for early patient mobilization and reduces many of the risks associated with conservative treatment.

The available options for the stabilization of femoral neck fractures in today's time include fixation using either cannulated cancellous screws or sliding hip screw.

The commonest complications while treating intra capsular fracture neck of femur are non-union and avascular necrosis.[3–5] The worldwide incidence of femoral neck fractures has continued to increase from an estimated 1.3 million hip fractures in 1990.

The fracture is regarded as a vascular injury to the bone's blood supply.[6–9]

The degree of vascular compromise is thought to directly correlate with the displacement of the fracture which affects fracture union an leading to complications. Hence intracapsular fracture neck of femur is regarded as an orthopedic emergency[10] and needs to be reduced with rigid internal fixation which is believed to improve the circulation of femoral head and prevent the non-union and avascular necrosis.The simple and less traumatic technique of fixation with multiple cannulated screws placed in parallel by was introduced for intracapsular fractures of the hip in 1980,[11] in an attempt to increase the accuracy of fixation and to decrease the rate of complications. Internal fixation with cannulated cancellous screws after good anatomical reduction has the advantages of decreased blood loss and operative time, lower transfusion requirements and decreased length of hospital stay.[10]The use of sliding hip screws has been cited as having fundamental advantages, such as placing compression across the fracture at the time of reduction and having a strength that is greater than that of multiple cancellous screws.

Disadvantages of the sliding hip screw for femoral neck fracture stabilization include potential to create rotational malalignment of the femoral head at the time of screw insertion.[11] But this disadvantage is overcome by inserting derotation screw prior to placement of Richard screw.

In light of the fact that the use of a sliding hip screw as opposed to a cannulated screw for the fixation of intracapsular neck femur fractures is uncommon in our nation, the purpose of this comparative study was to evaluate the outcomes of both fixation modalities and the factors that influence these outcomes in our population.

Material And Methods:-

The study was conducted at Sri Aurobindo Medical College and PG Institute, Indore (M.P) from 1st April 2021 to 30th September 2022. This is a comparative Study.

All the patients were included in the study after obtaining voluntary written informed consent from the patient and/or his/her legally acceptable representatives.

All the patients visiting Sri Aurobindo Medical College and Postgraduate Institute, Indore during the study period with fracture neck of femur formed our study population.

Patients with age between 16 and 60 years of age, presenting within 3 weeks of Injury andclosed fractures were included in study

Patients withneglected fracture neck of femur (>3 weeks), Pathological fractures and patient not willing to give consent were excluded from the study.

The study included 40 patients with history of trauma and diagnosed with fracture neck of femur.After thorough evaluation of patient , Pre-operative radiograph of pelvis with both hips were taken.Routine preoperative profile was done in each patient, along with pre-anesthetic check-up.Follow-up X-rays were taken at each follow-up, which were scheduled at 6 weeks, 3 months, 6 months and at 12 months.One hour prior to surgery, parenteral routine antibiotics were administered.All the patients were operated under spinal/epidural anesthesia.

Patients were kept nil orally for 4 to 6 hours post-operatively, Intravenous fluids were given as needed, Intravenous Antibiotics were given till 5th postoperative day followed by 7 days of oral antibiotics.Analgesics were given according to the needs of the patient.

Check X- rays were taken to study the alignment of fracture fragments.

The wound was inspected at 2nd and5th postoperative day. Suture/staple removal was done on 13th postoperative day. X-rays were taken at each follow up visits to known about progressive fracture union and implant position.

Functional and radiological outcome were assessed by scoring

Modified Harris Hip Score
Interpretation of the score: Total Score: 100
Pain (with a maximum score of 44 points)
Function: Gait-Limp (11 points), Support (11 points), Distance walked (11 points)
Functional Activities: Stairs (04 points), Socks/Shoes (04 points), Sitting (05 points)
Range of motion (01points)
The ability to perform five functional tasks (25 points).

EXCELLENT	GOOD	FAIR	POOR
90-100	80-90	70-80	<70

Harris Hip Score

Pain *(check one)*
- ☐ None or ignores it (44)
- ☐ Slight, occasional, no compromise in activities (40)
- ☐ Mild pain, no effect on average activities, rarely moderate pain with unusual activity; may take aspirin (30)
- ☐ Moderate Pain, tolerable but makes concession to pain. Some limitation of ordinary activity or work. May require Occasional pain medication stronger than aspirin (20)
- ☐ Marked pain, serious limitation of activities (10)
- ☐ Totally disabled, crippled, pain in bed, bedridden (0)

Limp
- ☐ None (11)
- ☐ Slight (8)
- ☐ Moderate (5)
- ☐ Severe (0)

Support
- ☐ None (11)
- ☐ Cane for long walks (7)
- ☐ Cane most of time (5)
- ☐ One crutch (3)
- ☐ Two canes (2)
- ☐ Two crutches or not able to walk (0)

Distance Walked
- ☐ Unlimited (11)
- ☐ Six blocks (8)
- ☐ Two or three blocks (5)
- ☐ Indoors only (2)
- ☐ Bed and chair only (0)

Sitting
- ☐ Comfortably in ordinary chair for one hour (5)
- ☐ On a high chair for 30 minutes (3)
- ☐ Unable to sit comfortably in any chair (0)

Enter public transportation
- ☐ Yes (1)
- ☐ No (0)

Stairs
- ☐ Normally without using a railing (4)
- ☐ Normally using a railing (2)
- ☐ In any manner (1)
- ☐ Unable to do stairs (0)

Put on Shoes and Socks
- ☐ With ease (4)
- ☐ With difficulty (2)
- ☐ Unable (0)

Absence of Deformity (All yes = 4; Less than 4 =0)
- Less than 30° fixed flexion contracture ☐ Yes ☐ No
- Less than 10° fixed abduction ☐ Yes ☐ No
- Less than 10° fixed internal rotation in extension ☐ Yes ☐ No
- Limb length discrepancy less than 3.2 cm ☐ Yes ☐ No

Range of Motion (**indicates normal*)
- Flexion (*140°) _____
- Abduction (*40°) _____
- Adduction (*40°) _____
- External Rotation (*40°) _____
- Internal Rotation (*40°) _____

Range of Motion Scale

211° - 300° (5)	61° - 100 (2)
161° - 210° (4)	31° - 60° (1)
101° - 160° (3)	0° - 30° (0)

Range of Motion Score _____

Total Harris Hip Score _____

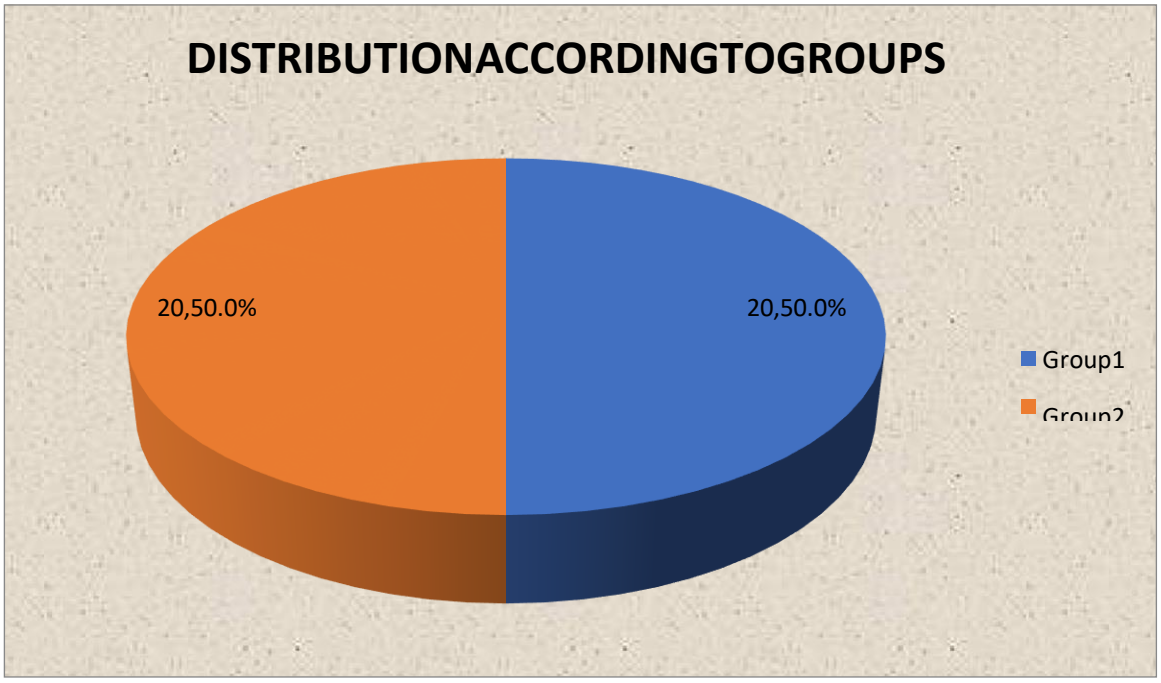
Observations and Results:-

TableNo. 1:- Distributionofpatientsaccordingtogroups.

Group	Frequency	Percentage
CCScrew(Group1)	20	50.0
DHSScrew(Group2)	20	50.0
Total	40	100.0

Theabovetableshows the distributionofpatients accordingto groups.

Therewere20(50%)patientsinCCscrewgroup(Group1)and20(50%)patientsinDHSScrew(Group2).



Graph 1:- Piediagramshows thedistribution ofpatientsaccordingto groups.

TableNo. 2:- Distributionofpatientsaccordingto age.

Age	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
17-20years	2	10.0	1	5.0
21-30years	8	40.0	5	25.0
31-40years	3	15.0	7	35.0
41-50years	4	20.0	5	25.0
51-60years	3	15.0	2	10.0
Total	20	100.0	20	100.0
MeanAge	34.10 ± 11.53		37.30 ± 10.14	
't'value, df	-0.932,df=38			
Pvalue	0.357,NS			

Unpaired't'testapplied.Pvalue=0.357,Notsignificant

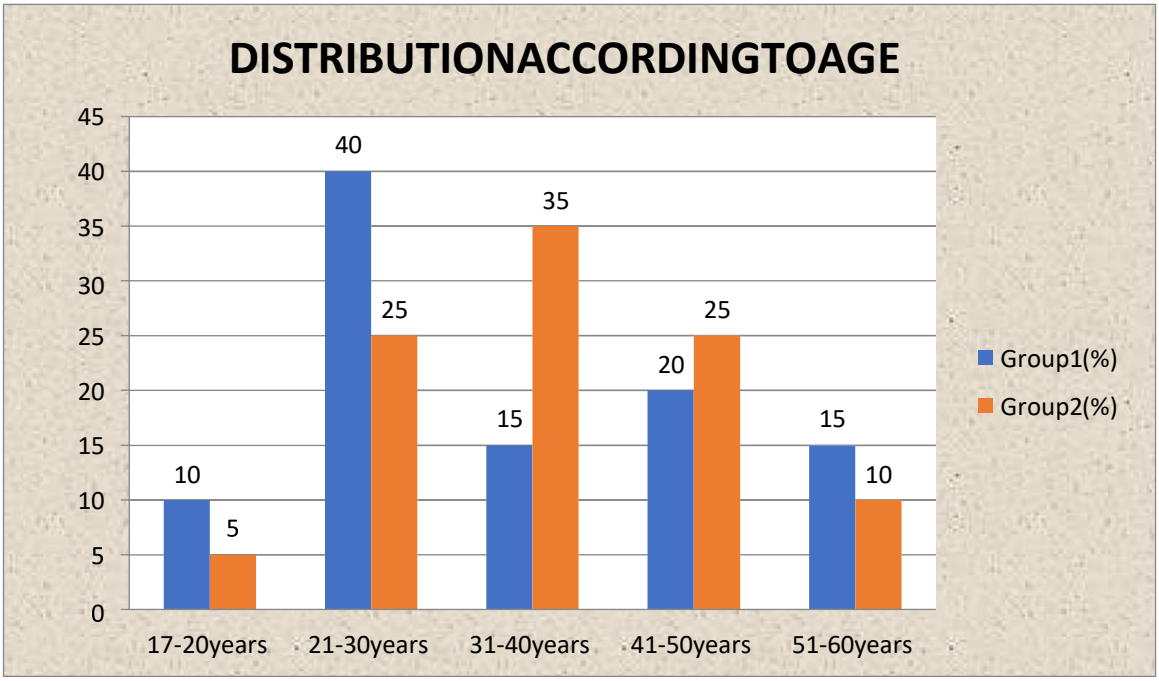
Theabovetableshows the distributionofpatients accordingto age.

InGroup1,2(10%)patientswereintheagegroup17-20years,8(40%)wereintheage group21-30years,3(15%)wereintheagegroup31-40years,4(20%)wereintheage group41-50years and3(15%) werein the agegroup 51-60years.

InGroup2,1(5%)patientwasintheagegroup17-20years,5(25%)wereintheagegroup21-30 years, 7(35%)werein theagegroup 31-40years, 5(25%) were in theagegroup41-50yearsand 2(10%)wereintheagegroup51-60years.

ThemeanageinGroup1was34.10±11.53yearsandinGroup2was37.30±10.14years.Thedifferencewasfound tobe statistically not significant (P=0.357).

Themeanages werecomparable betweenthetwogroups.



Graph 2:- Bardiagramshowsthedistribution accordingtoage

TableNo. 3:- Distributionofpatientsaccordingto sex.

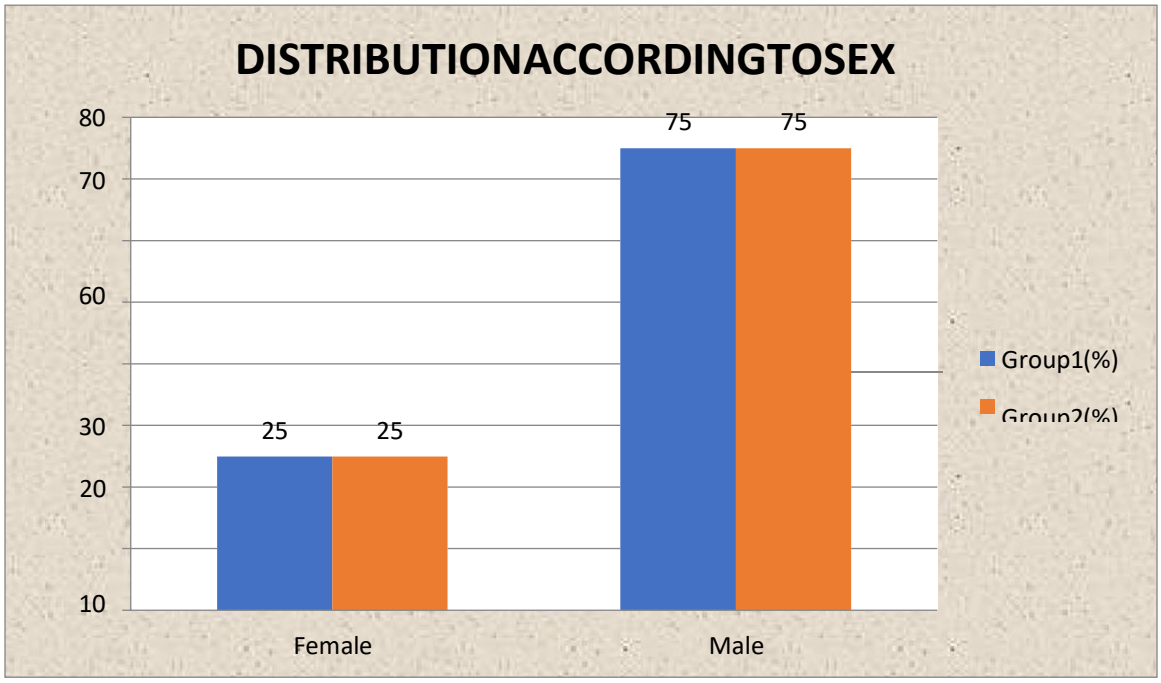
Sex	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
Female	5	25.0	5	25.0
Male	15	75.0	15	75.0
Total	20	100.0	20	100.0

PearsonChi-squaretestapplied.Chi-squarevalue=0.000,df=1,Pvalue=1.000,NotSignificant

The above table shows the distribution of patients according to sex.In**Group 1**, therewere5(25%) femalesand15(75%)males.

In **Group 2**, there were 5 (25%) females and 15 (75%) males.Inboth thegroups, majorityof thepatients weremales.

Therewasnostatisticallysignificantassociationbetweensexandthegroups(P=1.000),whichshows that groupsareindependent of sex.



Graph3:- Bardiagramshowsthedistribution accordingtosex.

TableNo. 4:- Distributionofpatientsaccordingtosideinvolved.

Sideinvolved	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
Leftside	10	50.0	13	65.0
Right side	10	50.0	7	35.0
Total	20	100.0	20	100.0

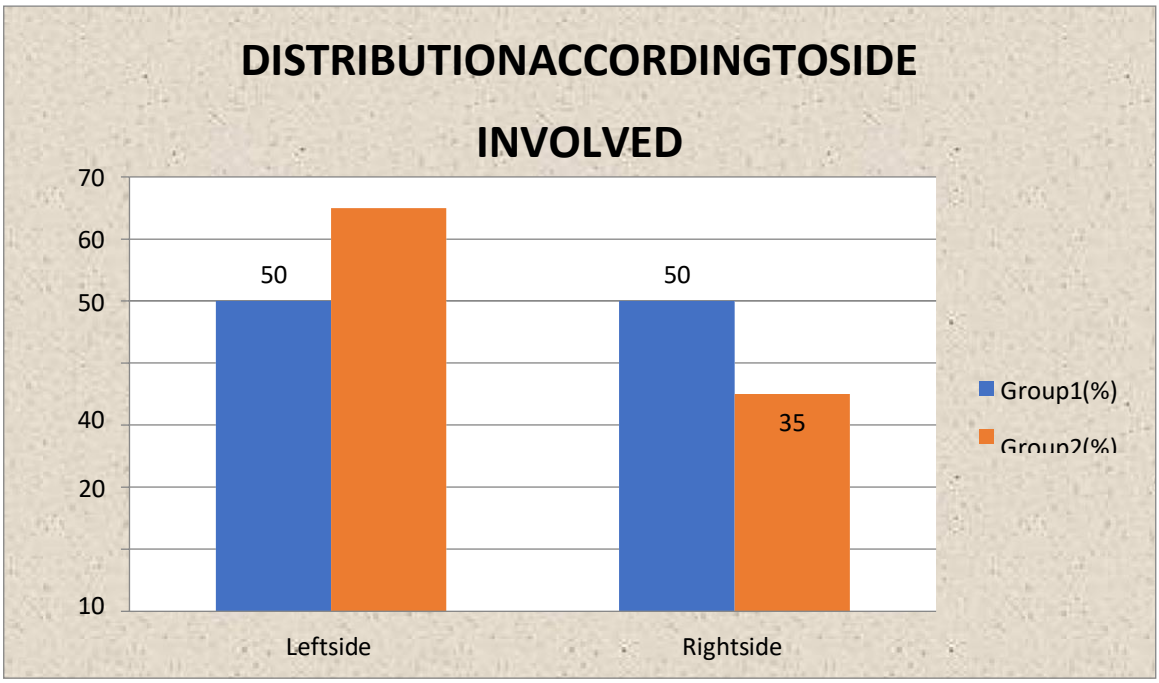
Theabovetableshowsthe distribution ofpatientsaccording to sideinvolved.

InGroup1,in10(50%) patientsleftsidewasinvolvedandin10(50%)patients'rightsidewasinvolved.

InGroup2,in13(65%)patientsleftsidewasinvolvedandin7(35%)patients'rightsidewasinvolved.

InGroup1boththesideswereequallyinvolved,whileinGroup2leftsidewasmoreinvolved.

Therewasnostatisticallysignificantassociationbetweensideinvolvedandthegroups(P=0.357),which showsthat groups areindependent of side involved.



Graph4:- Bardiagramshowsthedistribution accordingtosideinvolved.

TableNo. 5:-Distributionofpatientsaccordingtoanatomicalclassificationoffractures.

Anatomicalclassification	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
Basicervical	3	15.0	2	10.0
Subcapital	9	45.0	10	50.0
Transcervical	8	40.0	8	40.0
Total	20	100.0	20	100.0

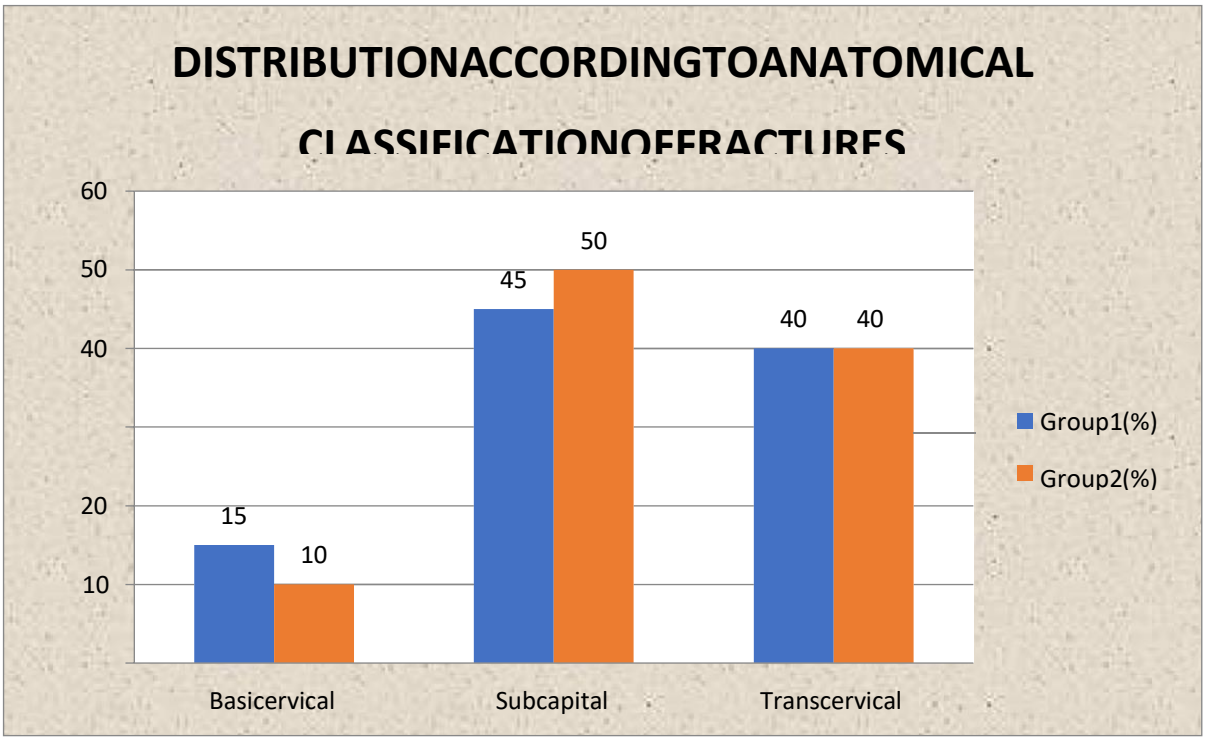
Pearson Chi-square test applied. Chi-square value = 0.253, df=2, P value = 0.881, NotSignificant

The above table shows the distribution of patients according to anatomical classification offractures.

In Group 1, in 3 (15%) patients, basicervical fractures were seen, in 9 (45%) patients,subcapitalfractureswere seenand in8(40%)patients,transcervical fractureswereseen.

In Group 2, in 2 (10%) patients, basicervical fractures were seen, in 10 (50%) patients,subcapitalfractureswere seenandin8(40%)patients,transcervicalfractureswereseen.

Therewasnostatisticallysignificantassociationbetweenanatomicalclassificationoffracturesandthegroups(P=0.881),whichshowsthatgroupsareindependentoftheanatomicalclassification offractures.



Graph 5:- Bar diagram shows the distribution according to anatomical classification offractures.

TableNo. 6:- DistributionofpatientsaccordingtoPauwel'sclassificationoffractures.

Pawel'sclassification	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
Grade1	10	50.0	2	10.0
Grade2	8	40.0	11	55.0
Grade3	2	10.0	7	35.0
Total	20	100.0	20	100.0

PearsonChi-squaretestapplied.Chi-squarevalue=8.585,df=2,Pvalue=0.014,Significant

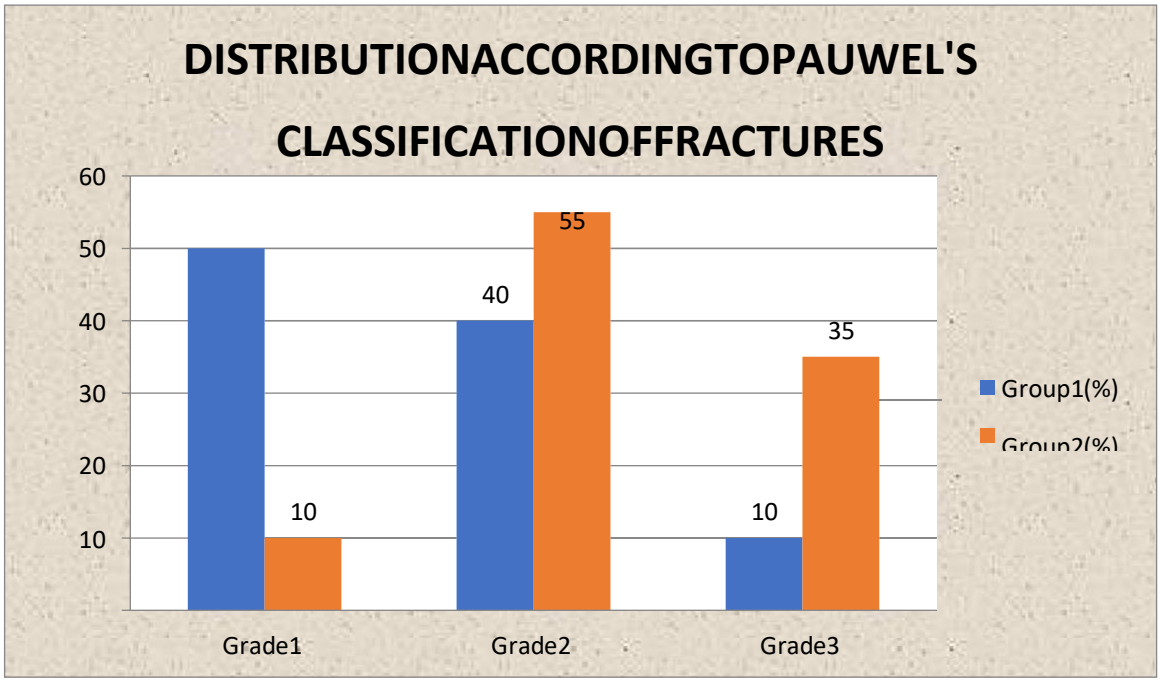
The above table shows the distribution of patients according to Pauwel's classification offractures.

InGroup1,Grade1fracturewasseenin10(50%)patients,Grade2fracturein8(40%) patientsandGrade3fracturein2 (10%)patients.

InGroup2,Grade1fracturewasseenin2(10%)patients,Grade2fracturein11(55%) patientsand Grade3 fracturein 7 (35%) patients.

There was a statistically significant association between Pawel's classification of fracturesandthegroups(P=0.014),whichshowsthatgroupsaredependentonthePawel'sclassificationoffractures.

Grade 1 fracture was more common in Group 1 and Grade 2 and 3 fractures were morecommonin Group 2.



Graph 6:- Bar diagram shows the distribution according to Pauwel's classification offractures.

Numberofpatientsaccording totimeintervals

TimeIntervals	Group 1	Group 2
At6weeks	20	20
At3 months	20	20
At6 months	20	20
At12 months	16	19

Theabovetableshowsthe numberofpatients accordingto timeintervals.

In**Group1**,At 6weeks,at3 monthsandat 6months, all20 patientswere evaluated,whileat12months, 16patientswere evaluated.At 12months4 patientshad developedAVN.

In**Group2**,At 6weeks,at3 monthsandat 6months, all20 patientswere evaluated,whileat12months,19patientswereevaluated.At12monthsonly1patienthaddevelopedAVN.

TableNo. 8:- ComparisonofmeanHarrisHipScoreatdifferenttimeintervalsin Group1patients.

TimeInterval	No.	Harris Hip Score[Mean±SD]	't'value	P value
6weeks	20	65.10 ± 3.26	-9.219, df=19	0.001*
3months	20	75.35 ± 5.49		
3months	20	75.35 ± 5.49	-5.960, df=19	0.001*
6months	20	79.45 ± 6.44		
6months	16	81.94 ± 4.15	-5.129, df=15	0.001*
12months	16	84.69 ± 4.51		

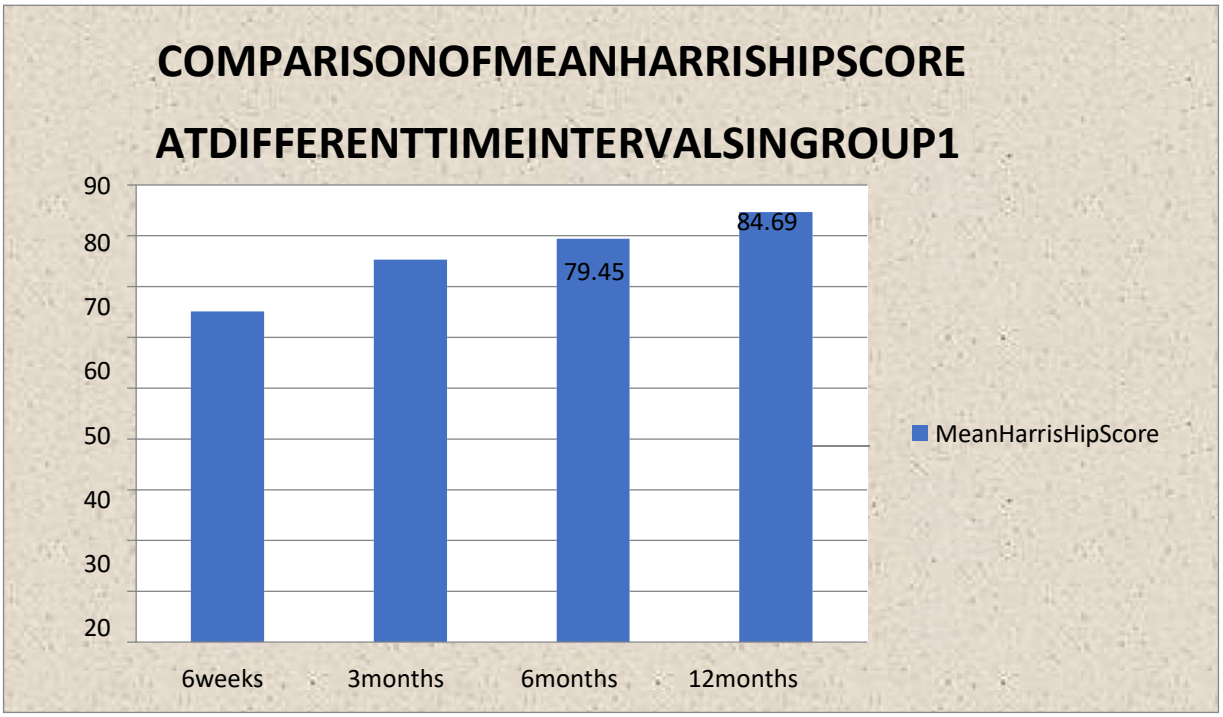
XPaired't'testapplied.Pvalue<0.05wastakenasstatisticallysignificant
The above table shows the comparison of mean Harris Hip Score at different time intervalsinGroup 1 patients.

InGroup1,themeanHarrisHipScoreat6weekswas65.10±3.26,at3monthsitwas

75.35± 5.49, at6 months it was79.45 ± 6.44 andat 12 months itwas 84.69 ± 4.51.

There was a significant improvement in mean Harris Hip Score at 3 months compared to 6weeks(P=0.001),at6monthscomparedto3months(P=0.001)andat12monthscomparedto6 months (P=0.001).

In Group 1 there was a significant improvement in mean Harris Hip Score till 12 monthsfrom6 weeks.



Graph 7:- Bar diagram shows the comparison of mean Harris Hip Score at differenttimeintervals in Group1 patients.

TableNo. 9:- ComparisonofmeanHarrisHipScoreatdifferenttimeintervalsin Group2patients.

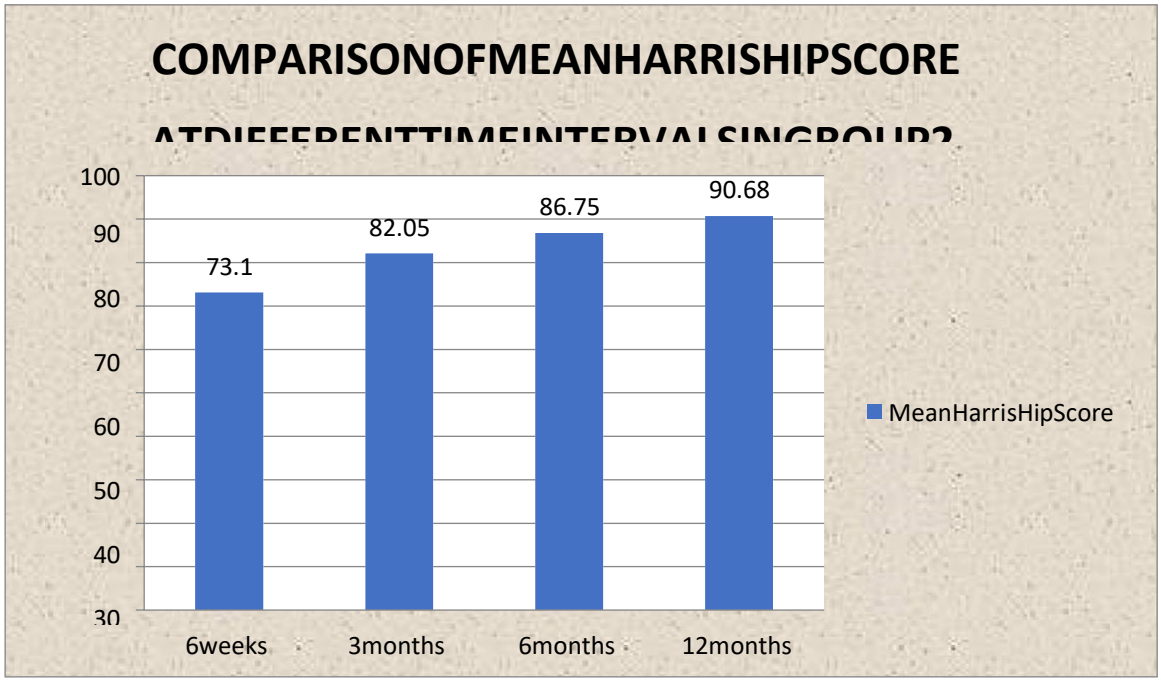
TimeInterval	No.	Harris Hip Score[Mean±SD]	't'value	P value
6weeks	20	73.10 ± 4.67	-8.252, df=19	0.001*
3months	20	82.05 ± 3.97		
3months	20	82.05 ± 3.97	-11.435, df=19	0.001*
6months	20	86.75 ± 3.13		
6months	19	87.21 ± 2.42	-9.202, df=18	0.001*
12months	19	90.68 ± 2.54		

Paired't'testapplied.Pvalue<0.05wastakenasstatisticallysignificant

The above table shows the comparison of mean Harris Hip Score at different time intervalsinGroup 2 patients.

InGroup2,themeanHarrisHipScoreat6weekswas73.10±4.67,at3monthsitwas
82.05± 3.97, at6 months it was86.75 ± 3.13 andat 12 months itwas 90.68 ± 2.54.

There was a significant improvement in mean Harris Hip Score at 3 months compared to 6weeks(P=0.001),at6monthscomparedto3months(P=0.001)andat12monthscomparedto6 months (P=0.001).
In Group 2 there was a significant improvement in mean Harris Hip Score till 12 monthsfrom6 weeks.



Graph 8:- Bar diagram shows the comparison of mean Harris Hip Score at differenttimeintervals in Group2 patients.

TableNo. 10:- ComparisonofmeanHarrisHipScorebetweenthetwogroupsatdifferenttimeintervals.

TimeInterval	Group1[Mean±SD](No.)	Group2[Mean±SD](No.)	't'value	P value
At6weeks	65.10 ± 3.26 (20)	73.10± 4.67 (20)	-6.285, df=38	0.001*
At3 months	75.35 ± 5.49 (20)	82.05 ± 3.97 (20)	-4.424, df=38	0.001*
At6 months	79.45 ± 6.44 (20)	86.75 ± 3.13 (20)	-4.563, df=38	0.001*
At12 months	84.69 ± 4.51 (16)	90.68 ± 2.54 (19)	-4.945, df=33	0.001*

Unpaired't'testapplied.Pvalue<0.05wastakenasstatisticallysignificant

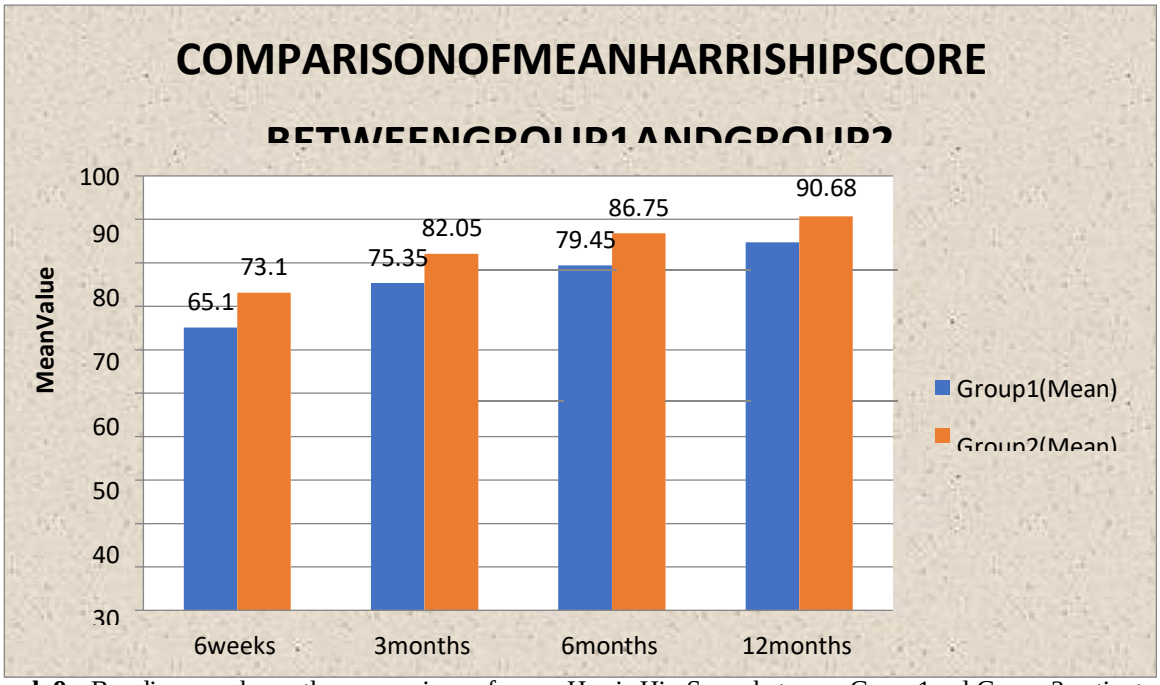
TheabovetableshowsthecomparisonofmeanHarrisHipScorebetweenthetwogroupsatdifferenttimeintervals.

At6weeks:ThemeanHarrisHipScoreinGroup1was65.10± 3.26andinGroup2itwas 73.10±4.67.The meanHarrisHipscoreat6weekswassignificantlyhigher inGroup2ascomparedto Group1 (P=0.001).

At 3 months: The mean Harris Hip Score in Group 1 was 75.35 ± 5.49 and in Group 2 itwas82.05±3.97.ThemeanHarrisHipscoreat3monthswassignificantlyhigherinGroup2as compared to Group1 (P=0.001).

At 6 months: The mean Harris Hip Score in Group 1 was 79.45 ± 6.44 and in Group 2 itwas86.75±3.13.ThemeanHarrisHipscoreat6monthswassignificantlyhigherinGroup2as compared to Group1 (P=0.001).

At 12 months: The mean Harris Hip Score in Group 1 was 84.69 ± 4.51 and in Group 2 itwas90.68±2.54.ThemeanHarrisHipscoreat12monthswassignificantlyhigherinGroup2as compared to Group1 (P=0.001).
ThemeanHarrisHipScoreatallfollow-ups(timeintervals)wassignificantlyhigherinGroup2 compared to Group 1.



Graph 9:- Bar diagram shows the comparison of mean Harris Hip Score between Group1and Group 2 patients.

TableNo. 11:- OutcomeaccordingtoHarris Hip Scoreat 12 months.

Outcome	Group 1		Group 2	
	Frequency	Percentage	Frequency	Percentage
Excellent	1	5.0	10	50.0
Good	11	55.0	9	45.0
Fair	4	20.0	0	0.0
Poor	0	0.0	0	0.0
AVN	4	20.0	1	5.0
Total	20	100.0	20	100.0

PearsonChi-squaretestapplied.Chi-squarevalue=13.364,df=3,Pvalue=0.004,Significant

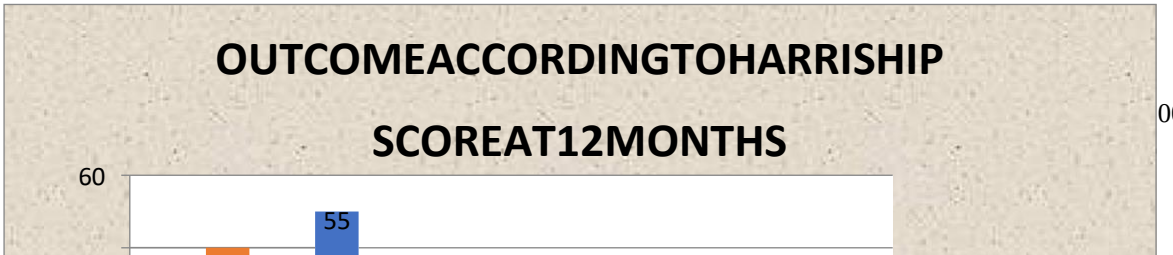
Theabovetableshowsthe outcome accordingtoHarris Hip Scoreat 12 months.

InGroup1,1(5%)patienthadexcellentoutcome,11(55%)patientshadgoodoutcomeand 4(20%)patientshadfair outcome.4(20%)patientshaddevelopedavascularnecrosis.

InGroup2,10(50%)patientshadexcellentoutcomeand9(45%)patientshadgoodoutcome.1 (5%) patient had developed avascularnecrosis.

Therewasastatisticallysignificantassociationbetweenoutcomeandthegroups(P=0.004),whichshows that the groups aredependent on theoutcome.

ExcellentoutcomewashigherinGroup2,whileprevalenceofgoodoutcomewashigherinGroup1. Avascular necrosiswas higher in Group 1 compared to Group2.



Graph10:- Bardiagramshows the outcomeaccording to HarrisHip Scoreat 12months

TableNo. 12:- Distributionaccordingtocomplications.

Complications	Group 1		Group 2		Fisher'sExactTest
	Frequency	Percentage	Frequency	Percentage	
None	16	80.0	19	95.0	1.000
AVN	4	20.0	1	5.0	1.000
Total	20	100.0	20	100.0	

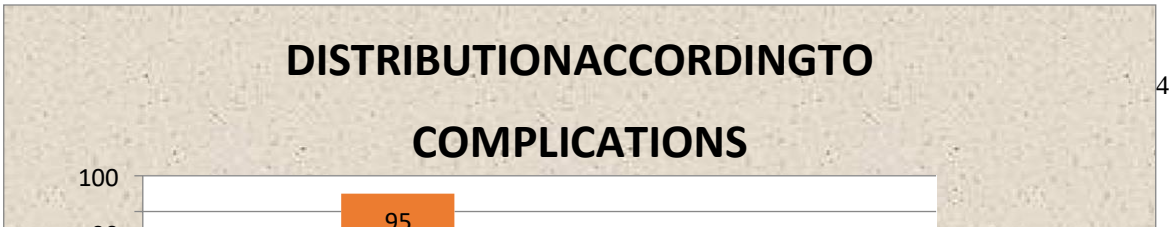
Fisher'sExacttestapplied.Pvalue<0.05wastakenasstatisticallysignificant

Theabovetableshowsthe distributionaccording to complications.

InGroup1,16(80%)patientshadnocomplications,and4(20%)patientshadavascularnecrosis.

InGroup2,19(95%)patientshadnocomplications,and1(5%)patienthadavascularnecrosis.

Theproportionalcomparisonofavascularnecrosiswasfoundtobestatisticallynotsignificant(P=1.00).



Graph 11:- Bardiagramshowsthedistribution accordingtocomplications.

Discussion:-

Femoral neck fracture is a challenging fracture. In younger patients, it is an orthopedicemergency,[12,13]whicharemainlycausedbyhigh-energytrauma,suchastrafficinjuries.[14]Theimplantsforinternalfixationofintracapsularfemoralneckfracturescanbedividedintothreecategories:multiplecancellousscrews,fixed-angledevicesthatallowsliding/compression,andfixed-angledevicesthatdonotallowforsliding/compression.[15]Multiplecancellous screws provide improved bone stock maintenance, anti-rotation, and femoralhead blood supply preservation when compared to fixed-angle fixation. However, the anglefixationdevicemayhavebetterresistancetovarusdeformityandmicromotionthantraditionalinvertedtriangularscrews.[16,17]InIndia,theuseofslidinghipscrewiscomparativelylessincomparisontocancellousscrewfixation.Hence,thepresentstudywasundertaken to compare and assess the radiological and functional outcome of both fixationmodalitiesas well ascomplicationsfollowing these fixations.

Weincluded40patientsofagebetween16and50years,presentingwithin3weeksofinjuryand having closed fractures. These patients were divided equally into two groups of 20patients each. Group 1 (n=20) patients underwent fracture fixation with cancellous screwandGroup2(n=20)patientsunderwentfracturefixationwith dynamichipscrew fixation.

In Group 1, most of the patients were in the age group 21-30 years and in Group 2, most ofthepatientswereintheagegroup31-40years.ThemeanageofpatientsinGroup1was 34.10 ± 11.53 years and in Group 2, it was 37.30 ± 10.14 years. The difference was foundto be statistically not significant. Both the groups were comparable with respect to the ageof the patients. In Singh et al.[18] study, the mean age of patients in DHS group was 27.2years and in CCS group was 30.4% years. In Patil et al.[19] study, the mean age of patientsinDHSgroupwas46.38±3.03yearsandincancellousscrewgroupwas38.38±2.33years.The mean ages of Singh et al.[18] study subjects is lower, while the mean ages of Patil etal.[19] study subjects is higher than our study's mean age. In Londhe et al.[20] study, theoverallmeanageofpatientswas35.5years,whichiscomparabletoourstudypatients'meanage.

Inbothgroups,therewere25%femalesand75% males.Malesoutnumberedthefemalesinourstudy.InSinghetal.[18]study,therewere34malesand9females.InLondheetal.[20] study, there were 67% males and 33% females. In Patil et al.[19] study, in DHS group, therewere 37.5% females and 62.5% males, and in MCCS group, there were 12.5% females and87.5% males. In all these studies, a male preponderance was seen, which supports ourstudy'sfinding.

In Group 1, left-side involvement was seen in 50% patients and right-side involvement in50% patients. In Group 2, left-side involvement was seen in 65% patients and right-sideinvolvementin35%patients.InGroup2,left-

sideinvolvementwasmorethantheright-sideinvolvement, while it was comparable in Group 1. In Londhe et al.[20] study, left-sideinvolvement was seen in 43.54% and right-side involvement in 56.45%. In their study,prevalence of right-side involvement was more as compared to the left-side involvement,whichis contrary to ourstudy findings.

Accordingtoanatomicalclassification,inGroup1,15%patientshadbasicervicalfractures,45%hadsubcapitalfracturesand40%hadtranscervicalfractures.InGroup2,10%patientshadbasicervicalfractures,50%hadsubcapitalfracturesand40%hadtranscervicalfractures.Therewasnosignificantassociationbetweenthegroupsandtheanatomicalclassificationoffractures. Both groups were comparable with regard to the anatomical classification offractures.

According to Pauwel's classification, in Group 1, 50% patients had Grade 1 fractures, 40%had grade 2 fractures and 10% had grade 3 fractures. In Group 2, 50% patients had Grade 1fractures,40%hadgrade2fracturesand10%hadgrade3fractures.Therewasasignificantassociation between the groups and the Pauwel's classification of fractures. Grade 2 andGrade 3 fractures are more common in Group 2, while Grade 1 fractures are more commonin Group 1. In Londhe et al.[20] study, 64.5% fractures were Pauwel's type-II fractures,22.5% fractures were Pauwel's type-I and 13% were Pauwel's type-III. In their study, mostofthepatientshadPauwel'stype-Ifractures,followedbyType-IIfractures,whichissimilartoour study'sfinding.

Follow-upofthesepatientsweredoneat6 weeks, 3months, 6 months andat 12 months.

InGroup1,themeanHarrisHipScoreat6weekswas65.10±3.26,at3monthsitwas 75.35±5.49,at6monthsitwas79.45±6.44andat12monthsitwas84.69±4.51.There wasasignificantimprovementinmeanHarrisHipScoreat3monthscomparedto6weeks,at6 months compared to3 months, and at 12months compared to 6 months.

InGroup2,themeanHarrisHipScoreat6weekswas73.10±4.67,at3monthsitwas 82.05 ± 3.97, at 6 months it was 86.75 ± 3.13 and at 12 months it was 90.68 ± 2.54. Therewasasignificantimprovementinmeanharrishipscoreat3monthscomparedto6weeks,at6 months comparedto3 months, andat 12 months comparedto 6 months.

WhenthemeanHarrisHipscoreswerecompared betweenthetwogroups, wefoundthatateach follow-up, the mean Harris Hip score was significantly higher in Group 2 patients incomparison to Group 1 patients. The overall functional outcome is better in Group 2 incomparisonto Group 1.

In Group 1, the Harris Hip Score grade was excellent in 5%, good in 55%, fair in 20% and20%patientshaddevelopedavascularnecrosis,soassessmentwasnotcarriedout.InGroup2, the Harris Hip Score grade was excellent in 50%, good in 45%, and 5% patients haddeveloped avascular necrosis, so assessment was not carried out. There was a significantassociationbetweenthegroupsandtheHarrisHipScoregrades.MostoftheGroup2patientsare having excellent Harris Hip score grade, while most of the Group 1 patients are havinggood Harris Hip score grade. In Londhe et al.[20] study, in DHS group, HHS outcome wasexcellent(61.3%),good(29%)andfair(9.7%);whileinCCS,itwasexcellent(25.8%),good(48.4%), fair (16.1%) and poor (9.7%). In another study done by Patil et al.,[19] in DHSgroup, HHS outcome was excellent (75%), good (18.7%), fair (6.2%) and poor (0%) and inMCCSgroup,HHSoutcomewasexcellent(56.2%),good(25%)andpoor(18.7%).Excellent outcome was higher in DHS group in comparison to the CCS group, whichsupportsour study'sfinding.

In Al-Kelabi et al., study, in MCS group, HHS outcome was excellent (26.1%), good(39.1%), fair (8.7%) and poor (26.1%), while in DHS group, HHS outcome was excellent(26.1%), good(43.5%),fair(8.7%)andpoor(21.7%)andtheyfoundnostatisticallysignificantassociationbetweenthegroupsandtheHarrisHipscoregradeswhichiscontrarytoour study'sfinding.

In our study, avascular necrosis was the only complication encountered. In Group 1, 20%patientshadavascularnecrosis,whileinGroup2,only5%ofthepatientshadavascular necrosis. Even though the prevalence of avascular necrosis was high in Group 1, we couldnot find any significant proportional difference between the two groups. In Patil et al.[19]study, in DHS group, AVN was seen in 6.25%, infection in 18.75%, non-union in 6.25%;while in MCCS group, AVN was seen in 18.75%, non-union in 12.5%, screw backout in12.5%andvaruscollapsein12.5%patients.Thecomplicationratewashigherincancellousscrew group in comparison to

the DHS group. In Gupta et al. study, AVN was reported tobe 7.5% in sliding hip screw and 6.7% in cancellous screw groups and no significantdifferencewasseen betweenthem, whichsupportsourstudy'sfinding.

Thelimitationsofthestudyisthatduetosmallersamplesize,somecomplicationslikescrewbackoutornon-unionwerenotseen,exceptforavascularnecrosis.Inspiteofthelimitations,the results obtained in our study are comparable with the available literature. There arelimited randomized control trials comparing DHS and cancellous screw fixations in thefracturetreatmentofneckoffemur,hence,werecommendthatmorerandomized-controlledtrialstakinglargesamplesize,withalong-termfollow-upwillprovidemoredetailedinsightintothe functional and clinical outcome ofthesetwo fixations.

Summary

1. The present thesis entitled "A Comparative Study of Using Dynamic Hip Screw VsMultiple Cancellous Screw Fixation in Fracture Neck of Femur in Young Adults" wasconductedon40patients.20patientsunderwentdynamichipscrewfixationand20patientsunderwentcancellousscrewfixationforfractureneckoffemur.Theresultsofthethesisaresummarizedas under:
2. Therewere20(50%)patientsinCCscrewgroup(Group1)and20(50%)patientsinDHSScrew (Group 2).
3. InGroup1,2(10%)patientswereintheagegroup17-20years,8(40%)wereintheage group 21-30 years, 3 (15%) were in the age group 31-40 years, 4 (20%) were inthe age group 41-50 years and 3 (15%) were in the age group 51-60 years. In Group2, 1 (5%) patient was in the age group 17-20 years, 5 (25%) were in the age group21-30 years, 7 (35%) were in the age group 31-40 years, 5 (25%) were in the agegroup41-50 years and 2(10%)werein theagegroup 51-60years.
4. ThemeanageinGroup1was34.10±11.53yearsandinGroup2was37.30±10.14years.Thedifferencewas foundto bestatistically not significant(P=0.357).
5. InGroup1,therewere5(25%)femalesand15(75%)males. InGroup2,therewere
6. 5(25%)femalesand15(75%)males.Therewasnostatisticallysignificantassociation between sex and the groups (P=1.000), which shows that groups areindependentof sex.
7. In Group 1, in 10 (50%) patients left side was involved and in 10 (50%) patients'right side was involved. In Group 2, in 13 (65%) patients left side was involved andin 7 (35%) patients' right side was involved. There was no statistically significantassociation between side involved and the groups (P=0.357), which shows thatgroupsareindependent of sideinvolved.
8. InGroup1,in3(15%)patients,basicervicalfractureswereseen,in9(45%)patients,subcapital fractures were seen and in 8 (40%) patients, transcervical fractures wereseen. In Group 2, in 2 (10%) patients, basicervical fractures were seen, in 10 (50%)patients,subcapitalfractureswereseenandin8(40%)patients,transcervical fractureswereseen.Therewasnostatisticallysignificantassociationbetweenanatomical classification of fractures and the groups (P=0.881), which shows thatgroupsareindependent oftheanatomicalclassificationoffractures.
9. In Group 1, Grade 1 fracture was seen in 10 (50%) patients, Grade 2 fracture in 8(40%)patientsandGrade3fracturein2(10%)patients.InGroup2,Grade1fracturewas seen in 2 (10%) patients, Grade 2 fracture in 11 (55%) patients and Grade 3fracturein7(35%)patients.TherewasastatisticallysignificantassociationbetweenPawel's classification of fractures and the groups (P=0.014), which shows thatgroupsaredependent on thePawel's classification offractures.
10. In Group 1, the mean Harris Hip Score at 6 weeks was 65.10 ± 3.26, at 3 months itwas75.35±5.49,at6monthsitwas79.45±6.44andat12monthsitwas84.69±
11. 4.51. There was a significant improvement in mean Harris Hip Score at 3 monthscompared to 6 weeks (P=0.001), at 6 months compared to 3 months (P=0.001) andat12 months compared to 6 months (P=0.001).
12. In Group 2, the mean Harris Hip Score at 6 weeks was 73.10 ± 4.67, at 3 months itwas82.05±3.97,at6monthsitwas86.75±3.13andat12monthsitwas90.68±
13. 2.54. There was a significant improvement in mean Harris Hip Score at 3 monthscompared to 6 weeks (P=0.001), at 6 months compared to 3 months (P=0.001) andat12 months compared to 6 months (P=0.001).
14. At 6 weeks: The mean Harris Hip Score in Group 1 was 65.10 ± 3.26 and in Group2itwas73.10±4.67.ThemeanHarrisHipscoreat6weekswassignificantlyhigherinGroup 2 as compared to Group 1 (P=0.001).
15. At3months:ThemeanHarrisHipScoreinGroup1was75.35±5.49andinGroup2itwas82.05±3.97.ThemeanHarrisHipscoreat3monthswassignificantlyhigherinGroup 2 as compared to Group 1 (P=0.001).
16. At6months:ThemeanHarrisHipScoreinGroup 1was79.45±6.44andinGroup2itwas86.75±3.13.ThemeanHarrisHipscoreat6monthswassignificantlyhigherinGroup 2 as compared to Group 1 (P=0.001).

17. At12months:ThemeanHarrisHipScoreinGroup1was84.69±4.51andinGroup2 it was 90.68 ± 2.54. The mean Harris Hip score at 12 months was significantlyhigherin Group 2 ascompared to Group 1(P=0.001).
18. In Group 1, 1 (5%) patient had excellent outcome, 11 (55%) patients had goodoutcome and 4 (20%) patients had fair outcome. 4 (20%) patients had developedavascularnecrosis.InGroup2,10(50%)patientshadexcellentoutcomeand9(45%)patients had good outcome. 1 (5%) patient had developed avascular necrosis. Therewasastatisticallysignificantassociationbetweenoutcomeandthegroups(P=0.004),whichshows that thegroups aredependent on theoutcome.
19. In Group 1, 16 (80%) patients had no complications, and 4 (20%) patients hadavascular necrosis. In Group 2, 19 (95%) patients had no complications, and 1 (5%)patient had avascular necrosis. The proportional comparison of avascular necrosiswasfound to bestatistically not significant (P=1.00).

Conclusion:-

When it came to treating fractures of the neck of the femur in young adults, our researchfound that dynamic hip screw fixation performed better than cancellous screw fixation. Interms of functional outcome, the dynamic hip screw had a higher Harris Hip Score and alowerrateof avascularnecrosis.

Basedonthefindingsofthisstudy,werecommendusingadynamichipscrewratherthanacancellousscrew to fixafractureoftheneck of thefemur.

We recommend larger studies because there is a lack of research comparing these twofixationmodalities.

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